## Basic statistics of spatio-temporal variations of sea surface height derived from Topex altimeter data

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Using non-gridded Topex altimeter data, high resolution 2-d power spectra and spatio-temporal autocorrelation functions of sea surface height (SSH) variations are estimated and employed for studying anisotropic SSH fields varying in a broad range of scales. Due to high accuracy (a few millimeters in terms of SSH variation) of the presently developed statistical technique, we find, in particular, that wavenumber spectra of SSH variation along the equator exhibit a power-law behavior $F(k) \propto k^{-2}$ on scales from about 1000 km and up to $10^4$ km. Based on anal ysis of the spatio-temporal autocorrelation, these oscillations are identified as a broad-band system of baroclinic Rossby waves whose characteristic velocity is about 1.3 m/s and the velocity of longest-wave components about 2.1 m/s. Analysis of SSH variations in the North Atlantic reveals anisotropic 2-d spectra characterized by a rapid, nearly power-law-type roll-off at wavenumbers above 0.02 rad/km. The rate of this spectral fall-off is consistent with the kinetic energy spectra of 2-d vortex turbulence. This behavior disagrees with the earlier estimates of (1 -d) SSH spectra which were based on SSH measurements from individual satellite passes. The discrepancy is explained by considering a spectrum of inertia-gravity waves manifested in along-the-track observations.

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